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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/801,268

03/16/2004

Richard W. Foote

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06/19/2006

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DALLAS, TX 75380

EXAMINER

SMITH, BRADLEY

ART UNIT

PAPER NUMBER

2891

DATE MAILED: 06/19/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/801,268

Applicant(s)

FOOTE, RICHARD W.

Examiner

Bradley K. Smith

Art Unit

2891

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 20 March 2006.  
2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.  
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-10 and 21-30 is/are pending in the application.  
4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.  
5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.  
6) ☒ Claim(s) 1,3-5,21 and 24-26 is/are rejected.  
7) ☒ Claim(s) 2,6-10,22,23 and 27-30 is/are objected to.  
8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.  
10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).  
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some \* c) ☐ None of:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)  
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)  
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_.  
4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.  
5) ☐ Notice of Informal Patent Application (PTO-152)  
6) ☐ Other: \_\_\_\_\_.

## **DETAILED ACTION**

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1, 4, and 5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gonzalez et al. in view of the prior art (figure 1). With regards to claim 1 Gonzalez et al. disclose placing a triangular (column 10 line 67) shaped layer of polysilicon (22) on a layer of insulating material and a layer of titanium silicide (24) over the polysilicon. However Gonzalez fails to disclose the heating of the titanium and polysilicon in order to form c49 phase of titanium, whereas the prior art discloses the formation of c49 phase of titanium. With regards to claim 4, the prior art disclose forming the titanium silicide at 620 degrees. With regards to claim 5, it is a standard practice to remove unconverted metal after forming silicide. Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to combine Gonzalez and the prior art because forming the c49 phase is well known in the art and the c49 phase would have more uniform resistance than an aggregate of polysilicon and titanium silicide.

Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Gonzalez et al. in view of the prior art (figure 1). Gonzalez and the prior art disclose the claimed invention except for the layer of titanium is 500 angstroms. It would have been obvious to one of ordinary skill in the art at the time the invention was made to form a layer a titanium that is 500 angstroms thick, since it has been held the discovering an optimum value of a result effective variable involves only routine skill in the art. In re Boesch 617 F.2d 272, 205 USPQ 215(CCPA 1980). Furthermore the thickness would readily react with the underlying polysilicon.

Claims 21, 24, and 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gonzalez et al. in view of Iyer (US Patent 6,281,101). Gonzalez et al. disclose placing a triangular (column 10 line 67) shaped layer of polysilicon (22) on a layer of insulating material and a layer of titanium silicide (24) over the polysilicon. However Gonzalez fails to disclose the heating of the titanium and polysilicon in order to form c49 phase of titanium and then heating the c49 to form a c54 phase of silicon. Iyer discloses the formation of c49 silicon occurs when a layer of  $TiSi_2$  is first formed (column 1 line 33-36) and then heating the c49 phase to form c54 layer to change the resistance. With regards to claim 25 Iyer disclose forming c49 in a range of 500-750 degrees C. Therefore it would have been obvious to one of ordinary skill in the art to combine the teachings of Gonzalez and Iyer, because the heating of the titanium silicide layer would change the c49 to a c54 therefore enabling on to change the resistance of the resistor.

Claim 26 is rejected under 35 U.S.C. 103(a) as being unpatentable over Gonzalez et al. in view of Iyer (US Patent 6,281,101). Gonzalez et al. disclose placing a triangular (column 10 line 67) shaped layer of polysilicon (22) on a layer of insulating material and a layer of titanium silicide (24) over the polysilicon. However Gonzalez fails to disclose the heating of the titanium and polysilicon in order to form c49 phase of titanium and then heating the c49 to form a c54 phase of silicon. Iyer discloses the formation of c49 silicon occurs when a layer of  $TiSi_2$  is first formed (column 1 line 33-36) and then heating the c49 phase to form c54 layer to change the resistance. With regards to claim 25 Iyer disclose forming c49 in a range of 500-750 degrees C. Gonzalez et al. in view of Iyer disclose the claimed invention except for the titanium having a thickness of 500 angstroms. It would have been obvious to one of ordinary skill in the art at the time the invention was made to deposit titanium with a thickness of 500 angstroms, since it has been held the discovering an optimum value of a result effective variable involves only routine skill in the art. In re Boesch 617 F.2d 272, 205 USPQ 215(CCPA 1980).

***Allowable Subject Matter***

Claims 2, 6-10, 22, 23 and 27-30 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter: the prior art of record neither teaches nor suggests coupling a small end of said triangularly shaped layer of polysilicon to an input contact; coupling a large end of said polysilicon to an output contact; triangularly shaped layer of coupling an input metal connector to said input contact; and coupling an output metal connector to said output contact (claims 2, 22 and 23) or applying a current to said triangularly shaped layer of C49 type TiSi<sub>2</sub> in said triangularly shaped layer of polysilicon; and converting a portion of said triangularly shaped layer of C49 type TiSi<sub>2</sub> to C54 type TiSi<sub>2</sub> to lower a resistance of said triangularly shaped layer of C49 type TiSi<sub>2</sub> (claims 6-10 and 27-30).

### ***Response to Arguments***

Applicant's arguments filed 3/20/06 have been fully considered but they are not persuasive. In response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986). Furthermore the previous rejection laid out the reasons for heating the titanium silicide to form a C49 phase silicide, because forming c49 is very common (well known in the art), titanium silicide typically only exists in two phases c49 and c54 and c49 is usually formed first when forming titanium silicide (see Iyer US Patent 6,281,101).

***Conclusion***

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

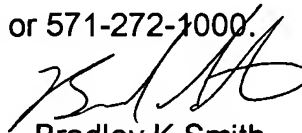
A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Bradley K. Smith whose telephone number is 571-272-1884. The examiner can normally be reached on 10-6.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Bill Baumeister can be reached on 571-272-1722. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 2891

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



Bradley K Smith  
Primary Examiner  
Art Unit 2891